

WHAT IS CLAIMED IS:

1. A concrete base pole, comprising:

a tubular shaped concrete body, defining an elongated direction and

5 having an outer surface with a circular cross-section in its lower portion;

inner and outer reinforcing cages embedded within said concrete base,

each of said reinforcing cages including strands extending in the elongated direction of

the concrete body and including a spiral reinforcement tied to its respective strands.

10 2. A concrete base pole as recited in claim 1, wherein each of said spiral reinforcements surrounds the respective strands to which it is tied.

15 3. A concrete base pole as recited in claim 1, wherein at least some of said strands are pretensioned.

4. A concrete base pole as recited in claim 3, wherein said concrete body defines an upper end and a lower end, and wherein some of said strands are encased in a sleeve in said upper end, are embedded in said concrete below said sleeve, extend through an upper bearing plate, and are post-tensioned.

20 5. A concrete base pole as recited in claim 4, wherein the upper portion of said concrete body has a polygonal shaped cross section.

6. A concrete base pole as recited in claim 5, wherein each of said spiral reinforcements surrounds the respective strands to which it is tied.

7. A concrete base pole as recited in claim 6, and further comprising a
5 polygonal shaped cross section metal upper pole telescopically mounted over the correspondingly-shaped upper portion of said concrete base.

8. A concrete base pole as recited in claim 7, wherein the upper portion of
said base pole and the lower portion of said upper pole are tapered so that, as the
10 upper pole is lowered onto the base pole, it reaches a position in which there is a tight
fit between the upper and base poles.

9. A concrete base pole as recited in claim 1, wherein said inner and outer
cages are coaxial.

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10. A hybrid pole, comprising:
a concrete base including upper and lower portions; and
a hollow upper extension pole including a thin wall having inner and outer
surfaces and having a lower end that is telescopically mounted over the upper portion
20 of said concrete base, the inner surface of said lower end being curved away from said
concrete base in order to reduce the opportunity for the upper pole to cut the concrete
base and in order to ease assembly of said upper pole onto the concrete base.

11. A hybrid pole as recited in claim 10, wherein said curved inner surface has a substantially parabolic shape, and approaches the concrete base substantially tangentially.

5 12. A hybrid pole as recited in claim 11, wherein the lowermost portion of said inner surface lies at an angle in the range of 30 degrees to 60 degrees from the vertical.

10 13. A hybrid pole as recited in claim 11, wherein said concrete base has a circular cross section lower portion and a polygonal cross section upper portion, and said upper pole has a polygonal cross section that mates with the upper portion of said concrete base.

15 14. A hybrid pole as recited in claim 13, wherein said concrete base includes a plurality of embedded, elongated reinforcing strands, at least some of which are pre-tensioned and at least some of which extend are post-tensioned.

15. A hybrid pole as recited in claim 14, wherein said reinforcing strands are arranged in inner and outer groups, each of said groups being surrounded by a respective spiral strand, forming inner and outer reinforcing cages.

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16. A hybrid pole as recited in claim 15, wherein said inner and outer cages are concentric.

17. A hybrid pole, comprising:

a concrete base pole, having a circular cross-section lower portion and a multi-sided polygonal-shaped upper portion, said concrete base pole including embedded inner and outer cages of reinforcing strands; and

5 a multi-sided, polygonal-shaped hollow upper pole, conforming to the shape of said concrete base pole upper portion, and telescopically mounted over said concrete base pole, wherein both the concrete base pole and the multi-sided upper pole are tapered, so that, as the upper pole moves down onto the lower pole, it reaches a point at which there is a tight fit.

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18. A hybrid pole as recited in claim 17, wherein said concrete base pole includes post-tensioned strands in its upper portion.

19. A hybrid pole as recited in claim 18, wherein said hollow upper pole has 15 an inner surface, an outer surface, and a lower edge, and wherein said inner surface is curved away from said concrete base adjacent to said lower edge.

20. A method for forming a concrete pole, comprising the steps of:
20 placing a plurality of first elongated reinforcing strands into a mold defining an upper end and a lower end and an axis, and tying said first elongated reinforcing strands to a first spiral strand surrounding the first elongated reinforcing strands;
inserting a first charge of wet concrete into said mold;
spinning said mold about its axis, thereby slinging said concrete outwardly

to form a compact outer wall with a hollow interior;
stopping the spinning and measuring the wall thickness;
adding additional wet concrete into said hollow interior; and
spinning said mold about its axis again.

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21. A method for forming a concrete pole as recited in claim 20, and further comprising the step of placing a plurality of second elongated reinforcing strands into said mold outside the first plurality of strands and tying said second elongated reinforcing strands to a second spiral strand surrounding the second elongated 10 reinforcing strands prior to inserting said first charge of wet concrete into said mold.

22. A method for forming a concrete pole as recited in claim 22, and further comprising the step of tensioning some of said strands prior to spinning said mold.

15 23. A method for forming a concrete pole as recited in claim 22, and further comprising the steps of encasing some of said elongated strands in casings for part of their length adjacent to the upper end of the mold prior to inserting the wet concrete; allowing said wet concrete to dry after said spinning again; and tensioning said encased elongated strands after said wet concrete has dried.

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24. A hybrid pole, comprising:
a concrete base pole, having a circular cross-section;
a hollow metal upper pole, having a polygonal cross-section, with a lower

portion telescopically mating with said concrete base pole with a friction fit, whereby the lower portion of the hollow metal pole deforms to a substantially circular cross-section to conform to the shape of the concrete base pole.

5 25. A hybrid pole as recited in claim 24, wherein said concrete base pole includes post-tensioned strands in the portion that is telescopically received into said upper pole.

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